Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims

1. (Previously presented) A non-human transgenic mammal, progeny or embryo thereof which has integrated into its genome DNA comprising a regulatory sequence of a mammalian nestin gene operably linked to a gene coding for a marker fluorescent protein, wherein the regulatory sequence includes a nestin promoter and a second intron, or fragment thereof, of the mammalian nestin gene, and wherein the gene coding for the marker fluorescent protein is expressed in multipotent stem and progenitor cells of the non-human transgenic mammal, progeny or embryo thereof, and the expression of the gene coding for the marker fluorescent protein is detected using fluorescence.

2. (Previously presented) The non-human transgenic mammal, progeny or embryo thereof of Claim 1 wherein the gene coding for the marker fluorescent protein is selectively expressed in multipotent stem and progenitor cells of the non-human transgenic mammal or progeny thereof.

3. (Previously presented) The non-human transgenic mammal, progeny or embryo thereof of Claim 1 wherein the gene coding for the marker fluorescent protein is expressed in neural stem and progenitor cells of the non-human transgenic mammal or progeny thereof.

4. (Original) The non-human transgenic mammal, progeny or embryo thereof of Claim 1 wherein the mammal is mouse.

5. (Original) The non-human transgenic mammal, progeny or embryo thereof of Claim 1 wherein the regulatory sequence of the mammalian nestin gene is obtained from rat nestin gene.

6. (Original) The non-human transgenic mammal, progeny or embryo thereof of Claim 1 wherein the regulatory sequence includes a second intron sequence of the mammalian nestin gene.

7. (Original) The non-human transgenic mammal, progeny or embryo thereof of Claim 1 wherein the regulatory sequence includes a promoter.

8. (Original) The non-human transgenic mammal, progeny or embryo thereof of Claim 7 wherein both the promoter and the regulatory sequence are obtained from the same mammalian nestin gene.

9. (Previously presented) A method of producing a non-human transgenic mammal which expresses a marker fluorescent protein in multipotent stem and progenitor cells, comprising:

(a) introducing into a fertilized egg of a non-human mammal, DNA comprising a regulatory sequence of a mammalian nestin gene operably linked to a gene

coding for a marker fluorescent protein, wherein the regulatory sequence includes a nestin promoter and a second intron, or fragment thereof, of the mammalian nestin gene, and wherein the gene coding for the marker fluorescent protein is expressed in multipotent stem and progenitor cells of the non-human mammal and expression of the gene coding for the marker fluorescent protein is detected using fluorescence;

(b) introducing the fertilized egg of (a) into a non-human mammal of the same species;

(c) allowing the non-human mammal to produce progeny which are non-human transgenic mammals; and

(d) selecting non-human mammal progeny of (c) whose multipotent stem and progenitor cells selectively express the marker fluorescent gene.

10. (Previously presented) The method of Claim 9 wherein the gene coding for a marker fluorescent protein is selectively expressed in multipotent stem and progenitor cells.

11. (Previously presented) The method of Claim 9 wherein the gene coding for a marker fluorescent protein is expressed in neural stem and progenitor cells.

12. (Currently amended) The method of Claim 9 wherein the non-human transgenic mammal is a mouse.

13. (Currently amended) The method of Claim 9 wherein the [[the]] regulatory sequence of the mammalian nestin gene is obtained from rat nestin gene.

14. (Original) The method of Claim 9 wherein the regulatory sequence comprises a second intron sequence of the mammalian nestin gene.

15. (Original) The method of Claim 14 wherein the regulatory sequence further includes a promoter.

16. (Original) The method of Claim 15 wherein both the promoter and the regulatory sequence are obtained from the same mammalian nestin gene.

17. (Original) A non-human transgenic mammal produced by the method of Claim 9.

18. (Previously presented) An expression construct comprising a promoter sequence, a gene coding for green fluorescent protein and a regulatory sequence present in the second intron of a mammalian nestin gene.

19. (Previously presented) A method for measuring a multipotent stem and progenitor cell population in an animal organ or region thereof, comprising:

measuring cells which fluoresce from the organ or region thereof of a non-human transgenic mammal which has integrated into its genome DNA comprising:

a regulatory sequence of a mammalian nestin gene operably linked to a gene coding for a fluorescent protein, wherein the regulatory sequence includes a nestin promoter and a second intron, or fragment thereof, of the mammalian nestin gene, and wherein the gene coding for the fluorescent protein is expressed in multipotent stem and progenitor cells of the non-human transgenic mammal and the expression of the gene coding for the marker fluorescent protein is detected using fluorescence,

wherein the cells which fluoresce are multipotent stem and progenitor cells.

20. (Original) The method of Claim 19 wherein the gene coding for a fluorescent protein is selectively expressed in multipotent stem and progenitor cells.

21. (Original) The method of Claim 19 wherein the gene coding for a fluorescent protein is expressed in neural stem and progenitor cells.

22. (Previously presented) The method of Claim 19 wherein the regulatory sequence includes a second intron sequence of the mammalian nestin gene.

23. (Previously presented) The method of Claim 19 wherein the regulatory sequence further includes a promoter.

24. (Previously presented) The method of Claim 23 wherein both the promoter and the regulatory sequence are obtained from the same mammalian nestin gene.

25. (Withdrawn) A method of obtaining primary, noncultured, multipotent stem and progenitor cells comprising isolating cells which express a marker/reporter protein from a non-human transgenic mammal, progeny or embryo thereof which has integrated into its genome DNA comprising a regulatory sequence of a mammalian nestin gene operably linked to a gene coding for the marker/reporter protein wherein the gene coding for the marker/reporter protein is expressed in multipotent stem and progenitor cells of the non-human transgenic mammal, progeny or embryo thereof.

26. (Withdrawn) A method of obtaining primary, noncultured, multipotent stem and progenitor cells comprising isolating fluorescent cells from a non-human transgenic mammal, progeny or embryo thereof which has integrated into its genome DNA comprising a regulatory sequence of a mammalian nestin gene operably linked to a gene coding for a fluorescent protein wherein the gene coding for the fluorescent protein is expressed in multipotent stem and progenitor cells of the non-human transgenic mammal, progeny or embryo thereof.

27. (Withdrawn) The method of Claim 26 wherein the gene coding for the fluorescent protein is selectively expressed in multipotent stem and progenitor cells of the non-human transgenic mammal, progeny or embryo thereof.

28. (Withdrawn) The method of Claim 26 wherein the gene coding for the fluorescent protein is expressed in neural stem and progenitor cells of the non-human transgenic mammal, progeny or embryo thereof.

29. (Withdrawn) The method of Claim 26 wherein the regulatory sequence comprises a second intron sequence of the mammalian nestin gene.

30. (Withdrawn) The method of Claim 26 wherein the regulatory sequence further includes a promoter.

31. (Withdrawn) The method of Claim 30 wherein both the promoter and the regulatory sequence are obtained from the same mammalian nestin gene.

32. (Withdrawn) The method of Claim 26 further comprising identifying and/or isolating genes expressed in said isolated fluorescent cells.

33. (Withdrawn) The method of Claim 26 further comprising identifying and/or isolating proteins expressed in said isolated fluorescent cells.

34. (Withdrawn) The method of Claim 26 further comprising identifying and/or isolating cell-specific surface antigens expressed on said isolated fluorescent cells.

35. (Withdrawn) The method of Claim 26 further comprising transplanting said isolated fluorescent cells into a live animal or a viable embryo.

36. (Withdrawn) The method of Claim 26 wherein fluorescent cells are isolated by fluorescent activated cell sorting.

37. (Withdrawn) A method for assessing a compound's ability to promote multipotent stem and progenitor cell differentiation, comprising:

(a) contacting live multipotent stem and progenitor cells, which have integrated into their genome DNA comprising a regulatory sequence of a mammalian nestin gene operably linked to a gene coding for a marker/reporter protein wherein the gene coding for the marker/reporter protein is expressed in multipotent stem and progenitor cells, with a compound to be assessed;

(b) determining a marker/reporter protein measurement of the live cells of a) in the presence of the compound; and

(c) comparing the marker/reporter protein measurement of b) to the marker/reporter protein measurement of live control cells;

wherein a decrease or absence of marker/reporter protein measurement of the live cells in the presence of the compound compared to the marker/reporter protein measurement of the live control cells is indicative of the compound's ability to promote multipotent stem and progenitor cell differentiation.

38. (Withdrawn) The method of claim 37 wherein the marker/reporter protein is a fluorescent protein and the marker/reporter protein measurement is fluorescence.

39. (Withdrawn) The method of Claim 38 wherein the gene coding for the fluorescent protein is selectively expressed in multipotent stem and progenitor cells.

40. (Withdrawn) The method of Claim 38 wherein the gene coding for a fluorescent protein is expressed in neural stem and progenitor cells.

41. (Withdrawn) The method of Claim 37 wherein the compound is a therapeutic agent.

42. (Withdrawn) The method of Claim 37 wherein the differentiation is to neural stem and progenitor cells.

43. (Withdrawn) A method for assessing a compound's toxicity to multipotent stem and progenitor cells, comprising:

(a) contacting live stem and progenitor cells, which have integrated into their genome DNA comprising a regulatory sequence of a mammalian nestin gene operably linked to a gene coding for a marker/reporter protein, wherein the gene coding for the marker/reporter protein is expressed in multipotent stem and progenitor cells, with a compound to be assessed;

(b) determining live cells expressing the marker/reporter protein in the presence of the compound; and

(c) comparing the live cells expressing the marker/reporter protein of b) to live, control cells expressing the marker/reporter protein;

wherein a decrease or absence of live cells expressing the marker/reporter protein in the presence of the compound compared to the live control cells expressing the

marker/reporter protein is indicative of the compound's toxicity to multipotent stem and progenitor cells.

44. (Withdrawn) The method of Claim 43 wherein the marker/reporter protein is a fluorescent protein and cells expressing the marker/reporter protein are fluorescent cells.

45. (Withdrawn) The method of Claim 44 wherein the gene coding for a fluorescent protein is selectively expressed in multipotent stem and progenitor cells.

46. (Withdrawn) The method of Claim 44 wherein the gene coding for fluorescent protein is expressed in neural stem and progenitor cells.

47. (Withdrawn) A method for assessing a compound's ability to promote differentiation of totipotent cells into multipotent stem and progenitor cells, comprising:

(a) contacting live totipotent stem and progenitor cells, which have integrated into their genome DNA comprising a regulatory sequence of a mammalian nestin gene operably linked to a gene coding for a marker/reporter protein, wherein the gene coding for the marker/reporter protein is expressed in multipotent stem and progenitor cells;

(b) determining a marker/reporter protein measurement of the live cells of a) in the presence of the compound; and

(c) comparing the marker/reporter protein measurement of b) to marker/reporter protein measurement of control cells;

wherein an increase of marker/reporter protein measurement in the presence of the compound compared to the marker/reporter protein measurement of control cells is indicative of the compound's ability to promote differentiation of totipotent cells into multipotent stem and progenitor cells.

48. (Withdrawn) The method of Claim 47 wherein the marker/reporter protein is a fluorescent protein and the marker/reporter protein measurement is fluorescence.

49. (Withdrawn) The method of Claim 48 wherein the gene coding for a fluorescent protein is selectively expressed in multipotent stem and progenitor cells.

50. (Withdrawn) The method of Claim 48 wherein the compound is a therapeutic agent.

51. (Previously presented) A transgenic mouse, progeny or embryo thereof which has integrated into its genome DNA comprising a regulatory sequence of a mammalian nestin gene operably linked to a gene coding for a marker fluorescent protein, wherein the regulatory sequence includes a nestin promoter and a second intron, or fragment thereof, of the mammalian nestin gene, and wherein the gene coding for the marker fluorescent protein is expressed in multipotent stem and progenitor cells of the transgenic mouse, progeny or embryo thereof and the expression of the gene coding for the marker fluorescent protein is detected using fluorescence.

52. (Previously presented) The transgenic mouse, progeny or embryo thereof of Claim 51 wherein the gene coding for the marker fluorescent protein is selectively expressed in multipotent stem and progenitor cells of the transgenic mouse or progeny thereof.

53. (Previously presented) The transgenic mouse, progeny or embryo thereof of Claim 51 wherein the gene coding for the marker fluorescent protein is expressed in neural stem and progenitor cells of the transgenic mouse or progeny thereof.

54. (Previously presented) The transgenic mouse, progeny or embryo thereof of Claim 51 wherein the regulatory sequence of the mammalian nestin gene is obtained from rat nestin gene.

55. (Previously presented) The transgenic mouse, progeny or embryo thereof of Claim 51 wherein the regulatory sequence includes a second intron sequence of the mammalian nestin gene.

56. (Previously presented) The transgenic mouse, progeny or embryo thereof of Claim 51 wherein the regulatory sequence includes a promoter.

57. (Previously presented) The transgenic mouse, progeny or embryo thereof of Claim 56 wherein both the promoter and the regulatory sequence are obtained from the same mammalian nestin gene.

58. (Previously presented) A method of producing a transgenic mouse which expresses a marker fluorescent protein in multipotent stem and progenitor cells, comprising:

(a) introducing into a fertilized egg of a mouse, DNA comprising a regulatory sequence of a mammalian nestin gene operably linked to a gene coding for a marker fluorescent protein, wherein the regulatory sequence includes a nestin promoter and a second intron, or fragment thereof, of the mammalian nestin gene, and wherein the gene coding for a marker fluorescent protein is expressed in multipotent stem and progenitor cells of the mouse and the expression of the gene coding for the marker fluorescent protein is detected using fluorescence;

(b) introducing the fertilized egg of (a) into a mouse;

(c) allowing the mouse to produce progeny which are transgenic mice; and

(d) selecting mice of (c) whose multipotent stem and progenitor cells selectively express the marker fluorescent gene.

59. (Previously presented) The method of Claim 58 wherein the gene coding for a marker fluorescent protein is selectively expressed in multipotent stem and progenitor cells.

60. (Previously presented) The method of Claim 58 wherein the gene coding for a marker fluorescent protein is expressed in neural stem and progenitor cells.

61. (Previously presented) The method of Claim 58 wherein the regulatory sequence of the mammalian nestin gene is obtained from rat nestin gene.

62. (Previously presented) The method of Claim 58 wherein the regulatory sequence comprises a second intron sequence of the mammalian nestin gene.

63. (Previously presented) The method of Claim 62 wherein the regulatory sequence further includes a promoter.

64. (Previously presented) The method of Claim 63 wherein both the promoter and the regulatory sequence are obtained from the same mammalian nestin gene.

65. (Previously presented) A transgenic mouse produced by the method of Claim 58.

66. (Previously presented) A method for measuring a multipotent stem and progenitor cell population in a mouse organ or region thereof, comprising:

measuring cells which fluoresce from the organ or region thereof of a transgenic mouse which has integrated into its genome DNA comprising:

a regulatory sequence of a mammalian nestin gene operably linked to a gene coding for a fluorescent protein, wherein the regulatory sequence includes a nestin promoter and a second intron, or fragment thereof, of the mammalian nestin gene, and wherein the gene coding for the fluorescent protein is expressed in multipotent stem and

progenitor cells of the transgenic mouse and the expression of the gene coding for the fluorescent protein is detected using fluorescence,

wherein the cells which fluoresce are multipotent stem and progenitor cells.

67. (Previously presented) The method of Claim 66 wherein the gene coding for a fluorescent protein is selectively expressed in multipotent stem and progenitor cells.

68. (Previously presented) The method of Claim 66 wherein the gene coding for a fluorescent protein is expressed in neural stem and progenitor cells.

69. (Previously presented) The method of Claim 66 wherein the regulatory sequence includes a second intron sequence of the mammalian nestin gene.

70. (Previously presented) The method of Claim 66 wherein the regulatory sequence further includes a promoter.

71. (Previously presented) The method of Claim 70 wherein both the promoter and the regulatory sequence are obtained from the same mammalian nestin gene.

72. (Previously presented) A method for measuring a multipotent stem and progenitor cell population in a live animal, organ or tissue of the live animal, comprising:

measuring fluorescence of cells from a live non-human transgenic mammal, or from an organ, tissue or region of the live non-human transgenic mammal, wherein the live non-human transgenic mammal has integrated into its genome DNA comprising:

a regulatory sequence of a mammalian nestin gene operably linked to a gene coding for a fluorescent protein, wherein the regulatory sequence includes a nestin promoter and a second intron, or fragment thereof, of the mammalian nestin gene, and wherein the gene coding for the fluorescent protein is expressed in multipotent stem and progenitor cells of the non-human transgenic mammal and the expression of the gene coding for the fluorescent protein is detected using fluorescence,

wherein the cells which fluoresce are multipotent stem and progenitor cells.

73. (Previously presented) The method of Claim 72 wherein the gene coding for a fluorescent protein is selectively expressed in multipotent stem and progenitor cells.

74. (Previously presented) The method of Claim 72 wherein the gene coding for a fluorescent protein is expressed in neural stem and progenitor cells.

75. (Previously presented) The method of Claim 72 wherein the regulatory sequence includes a second intron sequence of the mammalian nestin gene.

76. (Previously presented) The method of Claim 72 wherein the regulatory sequence further includes a promoter.

77. (Previously presented) The method Claim 72 wherein both the promoter and the regulatory sequence are obtained from the same mammalian nestin gene.

78. (Previously presented) An expression construct comprising a promoter sequence of mammalian nestin gene, a gene coding for a marker fluorescent protein, wherein the marker fluorescent protein is detected using fluorescence, and a regulatory sequence present in the second intron of said mammalian nestin gene.

79. (Previously presented) A non-human transgenic adult mammal which has integrated into its genome DNA comprising a regulatory sequence of a mammalian nestin gene operably linked to a gene coding for a fluorescent protein, wherein the regulatory sequence includes a nestin promoter and a second intron, or fragment thereof, of the mammalian nestin gene, and wherein the gene coding for the fluorescent protein is expressed in multipotent stem and progenitor cells of the non-human transgenic adult mammal and the expression of the gene coding for the fluorescent protein is detected using fluorescence.